

REMARKS

I. Rejections under 35 U.S.C. § 103(a) in view of Staheli (US 5,537,533) and Fukuhara et al. (US 6,760,861)

The Examiner has rejected claims 1-19, 27-29 and 31-34 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Staheli in view of Fukuhara.

A. Claim 1

Claim 1 recites “a relaying device for relaying data transferred from said first storage unit to said second data storage unit over the communication network, said relaying device being provided in a location that is pre-calculated and different from a location of said first and second storage units, so that, even if said first storage device cannot be operated due to a disaster, the operation of said relaying device can be continued.” (emphasis added)

The Examiner contends that the data transfer units 30 and 40 of Staheli disclose the claimed relaying device. In the September 21, 2006 Amendment, Applicant argued that the data transfer units 30, 40 of Staheli form a part of the servers 10, 12, respectively. For example, the remote server interfaces 32 and 42 are provided right on a side face of the servers 10 and 12. On the contrary, as set forth in claim 1, the relaying device is provided in a different location than the first and second storage units so that even if the first storage device cannot be operated due to a disaster (i.e., it is destroyed in a fire), the operation of the relaying device can be continued. Since the data transfer units 30 and 40 of Staheli are provided on the respective servers 10 and 12, if a disaster destroys the servers, Applicant submitted that the data transfer units will likewise be destroyed.

In response to the above arguments, the Examiner acknowledges that Staheli fails to disclose a relaying device provided in a location different than first and second storage units, but contends that Fukuhara does. In particular, the Examiner maintains that the multicasting engine of Fukuhara discloses a relaying device. However, as shown in Figure 22 of Fukuhara, the multicasting engine 332 is provided to communicate between a client system and servers, rather than between two servers themselves. Fukuhara specifically discloses that the multicasting engine is used to transfer data between and from a user device and two or more servers (col. 5, lines 8-15). Thus, the servers 340, 342 do not communicate with each other via the multicasting engine 332. Similar systems are also shown in Figures 1 and 3 of Fukuhara. Accordingly, if the teachings of Fukuhara were combined with the teachings of Staheli, the multicasting engine of Fukuhara would merely be provided between a client device and the servers 10 and 12 of Staheli, rather than between the servers 10, 12 themselves. Such system would fail to teach or suggest the claimed invention.

At least based on the foregoing, Applicant submits that claim 1 is patentable over the cited references.

B. Claims 2 and 3

Applicant submits that claims 2 and 3 are patentable at least by virtue of their dependency upon claim 1.

In addition, claim 3 recites “a plurality of said relaying devices, wherein said data transfer processing means in said first storage unit simultaneously sends data stored in said first storage unit to a plurality of said relaying devices.”

The Examiner acknowledges that Staheli fails to disclose the above features, but contends that Fukuhara does. In particular, the Examiner refers to Figures 3 and 21 of Fukuhara. In Figure 3, a plurality of multicasting engines 60A-60C (alleged relaying devices) are shown. However, a first storage unit does not simultaneously send data to the plurality of engines 60A-60C at the same time (i.e., simultaneously). As set forth in column 9, lines 37-54 of Fukuhara, each server 70A-70E is associated with a listening device 62A-62E. When a client makes a request, a multicasting engine, such as engine 60B, passes the request to at least two listening devices. The servers then return results to the engine 60B via the respective listening device. Based on such teachings, the servers only send data to a single engine that originally sent the data thereto. There is no teaching or suggestion of the servers sending data back to the original engine, i.e., engine 60B, *in addition to* at least one other engine.

Regarding Figure 21 of Fukuhara, there is no associated disclosure that either the server 1 or the server N transfer data simultaneously to both the multicast engine 1 and the multicast engine 2 (col. 18, lines 20-27).

At least based on the foregoing, Applicant submits that claim 3 is patentable over the cited references.

C. Claim 4

Since claim 4 contains features that are analogous to the features recited in claim 1, Applicant submits that claim 4 is patentable for at least analogous reasons as claim 4.

D. Claim 5

Claim 5 recites that a source unit creates at least one redundant data for error correction from original data to be transmitted. Further, the source unit transmits the original data and the redundant data in separate transmission units.

In the September 21, 2006 Amendment, Applicant argued that Staheli fails to teach or suggest that the server 10 creates and transmits redundant data for error correction that is separate from original data. For example, Applicant noted that Staheli teaches that the server 10 copies data destined for its own local hard disk 16. The mirrored data is sent to the link interface 34 of the data transfer unit 30, which in turn is then sent to the data transfer unit 40 and ultimately to the server 12 (col. 14, lines 36-52). Accordingly, Applicant argued that the server 10 does not create redundant data for error correction and then send both the redundant data and the original data to the data transfer unit 30 in separate data transmission units. Rather, only one data copy is sent from the server 10 to the data transfer unit 30.

In the current Office Action, the Examiner now refers to Figure 3 of Staheli for the creation of redundant data for error correction. In Figure 3, a checksum is prepared on the data so that CRC error checking can be used to detect transmission errors. Applicant submits, however, that the CRC error check relates to a method for error detection, whereas claim 5 is directed to performing error correction.

Additionally, the Examiner acknowledges that Staheli fails to disclose that original data and the redundant data are transmitted in separate transmission units, but contends that Fukuhara does. Specifically, the Examiner refers to Figures 6 and 7 of Fukuhara. Figures 6 and 7 are discussed in column 11, line 56 to column 12, line 13. There is absolutely no teaching or

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suggestion, in the cited figures and disclosure, of sending original data and redundant data for error correction in separate transmission units. The Examiner also refers to Figure 5, element 124 in this regard. However, in column 11, lines 40-55, Fukuhara merely discloses that at operation 124, client transactions or requests are processed using multicast transmission between engines and the listening devices, i.e., multicast engine transmits user requests to at least two listening devices. There is likewise no teaching or suggestion, in the cited figures and disclosure, of sending original data and redundant data for error correction in separate transmission units.

At least based on the foregoing, Applicant submits that Fukuhara fails to cure the deficient teachings of Staheli.

E. Claims 6-10

Since claims 6-10 are dependent upon claim 5, Applicant submits that such claims are patentable at least by virtue of their dependency.

F. Claim 11

Since claim 11 contains features that are analogous to the features recited in claim 5, Applicant submits that such claim is patentable for at least analogous reasons as set forth above.

G. Claims 12-16

Since claims 12-16 are dependent upon claim 11, Applicant submits that such claims are patentable at least by virtue of their dependency.

H. Claim 17

Claim 17 recites, "write execution requesting means for sending a delay write execution request to said storage unit of the standby system on receipt from a higher rank device of a restart

enabling point notification asserting a restart enabling point for which an application may directly restart operation for prevailing data state.”

The Examiner acknowledges that Staheli does not disclose the claimed notification of the restart enabling point, but contends that Fukuhara does. In particular, the Examiner refers to column 9, lines 14-30 of Fukuhara. As disclosed in the cited portion of Fukuhara, the multicast engines are configured to have fail-over capabilities. One of the engines can shadow another respective engine, so that if the respective engine becomes unavailable, the shadowing engine can take over. Applicant submits, however, that in mirroring, it is possible to restart the system if the data is written in a standby system based on the writing sequence being programmed in a normal system. In contrast, in delay writing, it is not always guaranteed that the data is written in the storage based on the writing sequence, and therefore it is not possible to restart the system. In the present invention, the restart enabling point/state can be notified from the normal system to the standby system to restart in the standby system by forming the restart enabling point/state in the standby system even in case of a delay writing.

At least based on the foregoing, Applicant submits that claim 17 is patentable over the cited references.

I. Claims 18 and 19

Applicant submits that claims 18 and 19 are patentable at least by virtue of their dependency on claim 17.

In addition, claim 18 recites that, “the delay write requesting means and the delay write execution requesting means in said storage unit of the operation system asynchronously send a

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delay write request and a delayed write execution request to said storage unit of the standby system.”

The Examiner acknowledges that Staheli fails to disclose sending requests asynchronously, but contends that Fukuhara does. The Examiner refers to column 7, lines 16-21 of Fukuhara in this regard. The cited portion, however, merely discloses that each server independently runs a copy of an application and independently processes a request. Therefore, it is disclosed that processing operations of each server are asynchronous with regard to other servers. The fact that the servers themselves run applications asynchronously from each other, fails to teach or suggest, or relate, to the “sending” of a delay write-request and a delayed write execution request “to” a single one of the servers asynchronously, as set forth in claim 18.

At least based on the foregoing, Applicant submits that claim 18 is patentable over the cited references.

J. Claims 27 and 29

Since claims 27 and 29 contain features that are analogous to the features discussed above for claim 1, Applicant submits that such claims are patentable for at least analogous reasons as claim 1.

K. Claim 28

Since claim 28 contains features that are analogous to the features recited in claim 5, Applicant submits that such claim is patentable for at least analogous reasons as set forth above.

L. Claim 31

Applicant submits that claim 31 is patentable at least by virtue of its dependency upon claim 1.

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M. Claims 32, 33 and 34

Applicant submits that claims 32, 33 and 34 are patentable at least by virtue of their dependency upon claim 17.

II. Rejections under 35 U.S.C. § 103(a) in view of West et al. (US 6,131,148) and Fukuhara

The Examiner has rejected claims 20, 22-26 and 30 under 35 U.S.C. § 103(a) as allegedly being unpatentable over West in view of Fukuhara.

A. Claim 20

Applicant submits that claim 20 is patentable over the cited reference. For example, claim 20 recites, “when the snap shot forming means in said storage unit of the standby system forms a snap shot, said write requesting means sends a write request to said storage unit of the standby system after said snap shot forming means completes forming the snap shot.”

The Examiner continues to maintain that column 4, lines 7-18 of West discloses the above feature. However, as set forth in the September 21, 2006 Amendment, the cited portion of West merely discloses that the primary subsystem 12 (alleged operating system) sends a snapshot copy request to the secondary subsystem 14 (alleged standby system) so that the secondary subsystem 14 can perform a snapshot copy. Upon completion thereof, West discloses that the primary subsystem 12 is signaled as to the completion of the snapshot copy operation. There is, however, no disclosure that upon completion of the snapshot copy operation, a *write request* is sent to a storage unit of the secondary subsystem 14, as recited in claim 20.

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The Examiner has failed to address the above arguments in the current Office Action.
Accordingly, Applicant respectfully requests that the Examiner respond to the arguments if the rejection is to be maintained.

In addition, claim 20 recites, "snap shot formation requesting means for sending a snap shot forming request to said storage unit of the standby system on receipt from a higher rank device of a restart enabling point notification asserting a restart enabling point for which an application may directly restart operation for prevailing data state."

The Examiner acknowledges that West fails to disclose the claimed restart enabling point, but contends that Fukuhara does. However, for at least analogous reasons as set forth above for claim 20, Applicant submits that Fukuhara fails to teach or suggest the claimed feature.

B. Claims 22-26

Applicant submits that claims 22-26 are patentable at least by virtue of their dependency upon claim 20.

C. Claim 30

Claim 30 recites the restart enabling feature of claim 20. Accordingly, Applicant submits that claim 30 is patentable for at least analogous reasons as claim 20.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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